APEX STANDARDS

3GPP Meeting Tracker with Automated Summaries and GPT Annotations

Fact Sheet
3GPP Meeting Tracker
17 April 2023

3GPP Meeting Tracker - the ultimate tool for a more efficient and productive meeting. With an organized matrix that compares company viewpoints and positions on topics within each agenda item, this tool provides valuable insight to chairmen, delegates, followers and back-office researchers alike. Key features include:

- Matrix comparison of company viewpoints and positions on agenda topics
- Automatic population of the matrix with summaries of TDoc contributions
- Clear and comprehensive overview of each company's position
- Identifying companies with similar positions for early topic merging suggestions
- Observation of differences and commongrounds as a basis for future discussions
- Ability to explore relevance of a company's position to their own interests
- Head-to-head TDoc comparisons and annotations for cost/benefit analysis
- Base report for tech professionals seeking quick access to latest meeting updates
- Base report as a starting point for adding personalized comments and analysis

To experienced the benefits of the Apex Standards 3GPP Meeting Tracker, contact support@apexstndards.com

References

[1] 3GPP Meeting RAN 1-112-bis-e as of April, 17, 2023 www.apexstandards.com/tracker.3gpp.r1-112-bis-e.html
[2] 3GPP Meeting SA 2-156-e as of April, 17, 2023 www.apexstandards.com/tracker.3gpp.s2-156-e.html
[3] Apex Standards Website www.apexstandards.com
[4] Apex Standards 3GPP TDoc Analysis Platform www.apexstandards.com/apex.3gpp.tdoc.pdf
[5] Apex Standards Domain-specific GPT www.apexstandards.com/apex.domain.gpt.pdf
[6] Product Matrix www.apexstandards.com/Apex.Standards.SaaS.Product.Matrix%202022-04.pdf

Source / Topic	BRID	DAA	PC5	Mode 2	In-coverage and Out-of-coverage scenarios	NR UAV	LTE PC5
Ericsson España S.A. [R2-2302907]	Support for broadcasting remote ID					Updated WID for NR support of UAV	
Qualcomm Incorporated [R2-2303060]	PC5-based BRID	PC5-based DAA message delivery for UAV	PC5-based BRID and DAA support			Approved (revised) WI for NR UAV	Approved parallel WI for LTE UAV
Nokia, Nokia Shanghai Bell [R2-2303174]	RAN2 Aspects of BRID for UAVs	RAN2 Aspects of DAA for UAVs	Support BRID and DAA via NR and LTE sidelink			Revised objective on BRID and DAA	Approved LTE counterpart
CMCC [R2-2303529]	Further discussion on UAV identification broadcast		PC5-U used to support BRID for UAV	Mode 2 supported	Support both in-coverage and out-of-coverage scenarios		
Beijing Xiaomi Mobile Software [R2-2303784]	Analysis of BRID broadcast over PC5	Analysis of DAA broadcast over PC5	BRID and DAA broadcast over PC5 interface				
Huawei, HiSilicon [R2-2303810]	Further discussion on UAV remote identification broadcast					New work item approved for NR UAV	
CATT [R2-2303903]		Discussion on PC5 based DAA mechanism	PC5 based DAA mechanism between UAV UE#1 and UAV UE#2				
CATT [R2-2303904]		Discuss the gap for supporting DAA as BRID				Added bullet for DAA in RAN#99 meeting	
vivo [R2-2303954]	Discussion on UAV identification broadcast		PC5-U used to support BRID for UAV	Mode 2 supported	Support both in-coverage and out-of-coverage scenarios		
ZTE Corporation, Sanechips [R2-2304157]	On UAV identification broadcast					Revised part related to BRID and DAA	Specify support for UAV identification broadcast in NR PC5

Table 1 presents the holistic view for 3GPP R2-121-bis-e Agenda Item 7.8.5, which focuses on UAV identification broadcast. The table's first column enumerates several corporations that have expressed a position or viewpoint in the agenda item, including Ericsson, Qualcomm, Nokia, China Mobile, Xiaomi, and Huawei, among others. The header row delineates the differentiating topics on which the companies diverge in their positions. For instance, concerning the initial topic, "BRID," Ericsson endorses the broadcasting of remote identification, Qualcomm specifically advocates for a "PC5-based BRID," and Nokia generally alludes to the "RAN2 Aspects of BRID for UAVs." When examining the table horizontally, it is evident that Ericsson articulates viewpoints on BRID and NR UAV, but does not address DAA, PC5, Mode2, In-coverage and Out-of-coverage scenarios, or LTE PC5 within this specific agenda item. The table provides a clear view for delegates and researchers to discern each company's stance on various topics. **Therefore, the table facilitates the identification of potential collaborators among companies with aligned interests, enabling them to engage in productive dialogues to reconcile their differences and foster consensus-building discussions, which are integral components of 3GPP meetings.**

TDoc comparison: R1-2302335 (Ericsson) R1-2303228 (CMCC) R1-2303450 (InterDigital, Inc.)

[TDoc R1-2302335]:

- The TDoc evaluates the effect of using fewer time-domain taps as input to the centralized direct path ToA estimation ML models in a highly non-LoS environment.
- Models using CIR inputs achieve better positioning accuracy than those using PDP inputs for the same number of training samples.
- Models using CIR or PDP inputs can achieve similar positioning accuracy at similar storage sizes of the training datasets when considering down sampling.
- UE positions are obtained with conventional positioning algorithms.

[TDoc R1-2303228]:

- The TDoc updates the agreement made in RAN1#110 AI 9.2.4.1 by adding an additional note about doubling the number of model parameters if complex values are used in the modeling process.
- The TDoc recommends evaluating the model input considering the tradeoff among model performance, model complexity, and computational complexity for both direct AI/ML positioning and AI/ML-assisted positioning.
- The TDoc notes that an individual company may treat {40%, 2m, 2m} as optional in their evaluation considering their specific AI/ML design.

[TDoc R1-2303450]:

- The TDoc evaluates the performance of an AI/ML model deployed on UE-side, CIR input under different SNR conditions, without model generalization, UE distribution area = 120x60 m.
- A more complex AI/ML model achieves ~ 1.2 m horizontal accuracy for 90% UEs, which is ~0.22 m worse than noiseless dataset.
- A less complex AI/ML model with CIR measurements as a model input achieves ~ 1.41 m horizontal accuracy for 90% UEs.

[TDoc R1-2308998]:

- The TDoc evaluates the performance of a direct AI/ML positioning technique with RSRP fingerprint as a model input in different scenarios.
- When L is less than or equal to 0.25m, the technique yields approximately similar (~3.3m) horizontal positioning accuracy for 90% UEs.

Example Snippets:

- "For a highly non-LoS environment such as the {60%, 6m, 2m} InF-DH scenario and assuming the same time domain resolution (i.e., the same sampling rate and the same number of taps)..." (TDoc R1-2302335)
- "Note: if complex value is used in modelling process, the number of the model parameters is doubled, which is also applicable for other AIs of AI/ML Agreement" (TDoc R1-2303228)
- "After performing training and testing with dataset of 10 dB SNR more complex AI/ML model achieves ~ 1.2 m horizontal accuracy for 90% UEs, which is ~0.22 m worse than noiseless dataset." (TDoc R1-2303450)
- "Direct AI/ML positioning technique with RSRP fingerprint as a model input, when L is less than or equal to 0.25m, yields approximately similar(~3.3m) horizontal positioning accuracy for 90% UEs." (TDoc R1-2308998)

Table 2 provides the head-to-head comparisons for Agenda Item 9.2.4.1 (Evaluation on AI/ML for positioning accuracy enhancement) during the 3GPP-R1-112-bis-e meeting. Companies Ericsson, CMCC, and InterDigital, Inc. presented their TDocs, focusing on evaluating AI/ML for positioning accuracy enhancement. The comparison of these TDocs reveals various approaches and technical differences among the companies, with each having its **pros and cons**. Ericsson's TDoc (R1-2302335) evaluates the effect of using fewer time-domain taps as input to centralized direct path ToA estimation ML models in a highly non-LoS environment. It emphasizes that models with CIR inputs achieve better positioning accuracy than those with PDP inputs. The **advantage** of this approach is that similar accuracy can be obtained with both CIR and PDP inputs at similar storage sizes when down sampling is considered. Based on the prior consensus and a way forward, CMCC's TDoc (R1-2303228) updates the agreement made in 3GPP-R1-110 Agenda Item 9.2.4.1 and emphasizes the importance of considering model performance, complexity, and computational complexity for both direct AI/ML positioning and AI/ML-assisted positioning. This approach allows flexibility for individual companies to treat certain parameters as optional, depending on their specific AI/ML design. InterDigital's TDoc (R1-2303450) assesses the performance of AI/ML models deployed on the UE side with CIR input under different SNR conditions. The results show that a more complex model provides better horizontal accuracy, but **at a slight cost** compared to a noiseless dataset. A less complex model with CIR measurements as input still achieves reasonable horizontal accuracy for 90% of UEs. **Comparing these TDocs highlights the importance of understanding the trade-offs among different AI/ML positioning approaches, model complexity, and computational demands. Such comparisons enable better decision-making and identification of potential collaborators to work towards consensus building, ultimately enhancing the positioning accuracy in the 3GPP framework.**